

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
3 February 2005 (03.02.2005)

PCT

(10) International Publication Number  
**WO 2005/009498 A3**

(51) International Patent Classification<sup>7</sup>: **A61L 27/36**, 31/08

(21) International Application Number: PCT/US2004/023188

(22) International Filing Date: 16 July 2004 (16.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 10/622,674 17 July 2003 (17.07.2003) US

(71) Applicant (*for all designated States except US*): **SCIMED LIFE SYSTEMS, INC.** [US/US]; One Scimed Place, Maple Grove, MN 55311-1566 (US).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **FREYMAN, Toby** [US/US]; 41 Warwick Road, Watertown, MA 02472 (US).

(74) Agents: **STERN, Gildon, D. et al.**; Jones Day, 222 East 41st Street, New York, NY 10017-6702 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

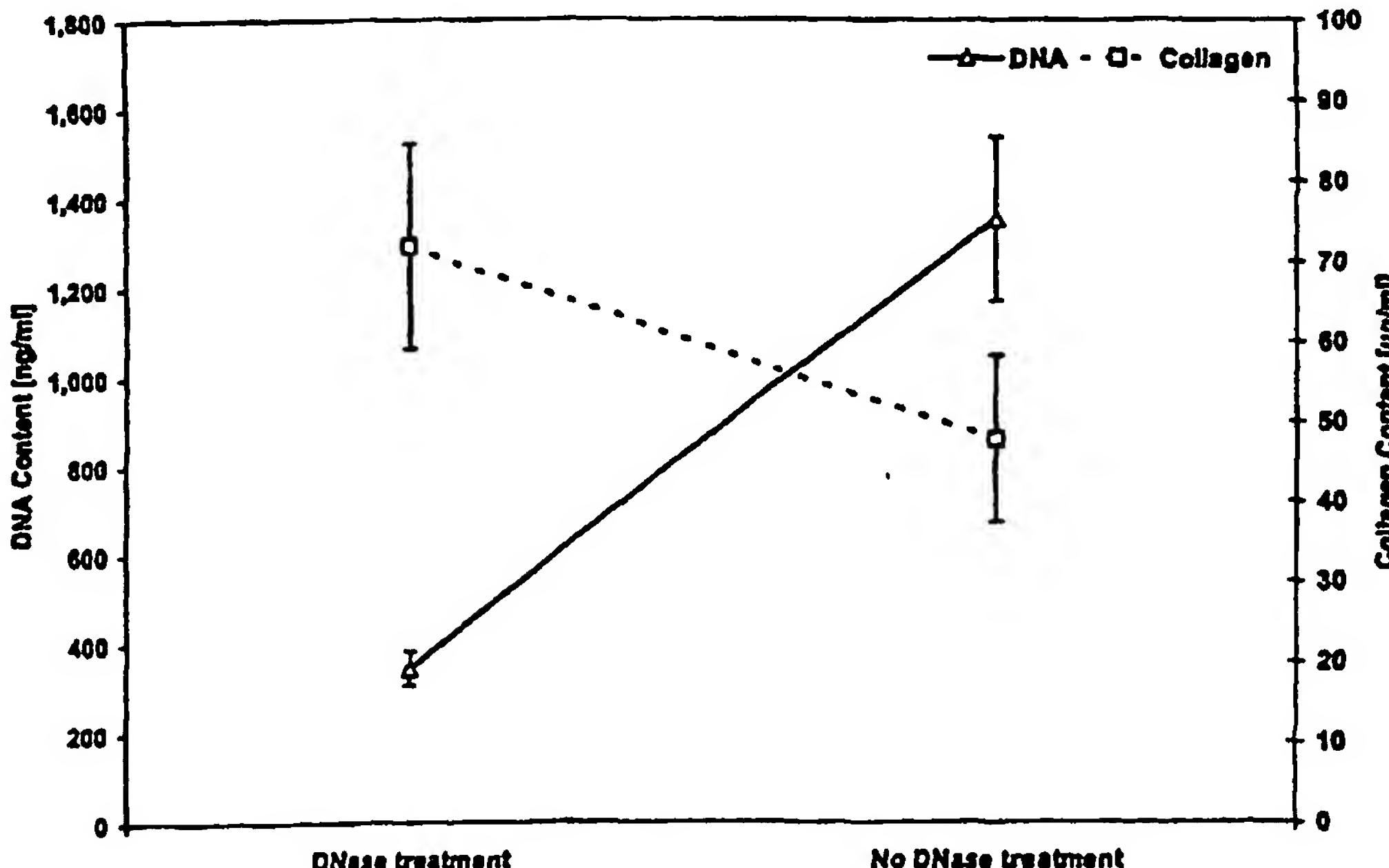
Published:

— with international search report

[Continued on next page]

(54) Title: DECELLULARIZED BONE MARROW EXTRACELLULAR MATRIX

**WO 2005/009498 A3**



(57) Abstract: The invention is directed to compositions comprising decellularized bone marrow extracellular matrix and uses thereof. Methods for repairing or regenerating defective, diseased, damaged or ischemic tissues or organs in a subject, preferably a human, using the decellularized bone marrow extracellular matrix of the invention are also provided. The invention is further directed to a medical device, preferably a scaffold, comprising decellularized bone marrow extracellular matrix.

ATTORNEY DOCKET NUMBER: 10177-118-999

SERIAL NUMBER: 10/622,293

REFERENCE: C09

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
3 February 2005 (03.02.2005)

PCT

(10) International Publication Number  
**WO 2005/009498 A3**

(51) International Patent Classification<sup>7</sup>: **A61L 27/36**, 31/08

(21) International Application Number:  
**PCT/US2004/023188**

(22) International Filing Date: 16 July 2004 (16.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/622,674 17 July 2003 (17.07.2003) US

(71) Applicant (*for all designated States except US*): SCIMED LIFE SYSTEMS, INC. [US/US]; One Scimed Place, Maple Grove, MN 55311-1566 (US).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): FREYMAN, Toby [US/US]; 41 Warwick Road, Watertown, MA 02472 (US).

(74) Agents: STERN, Gidon, D. et al.; Jones Day, 222 East 41st Street, New York, NY 10017-6702 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

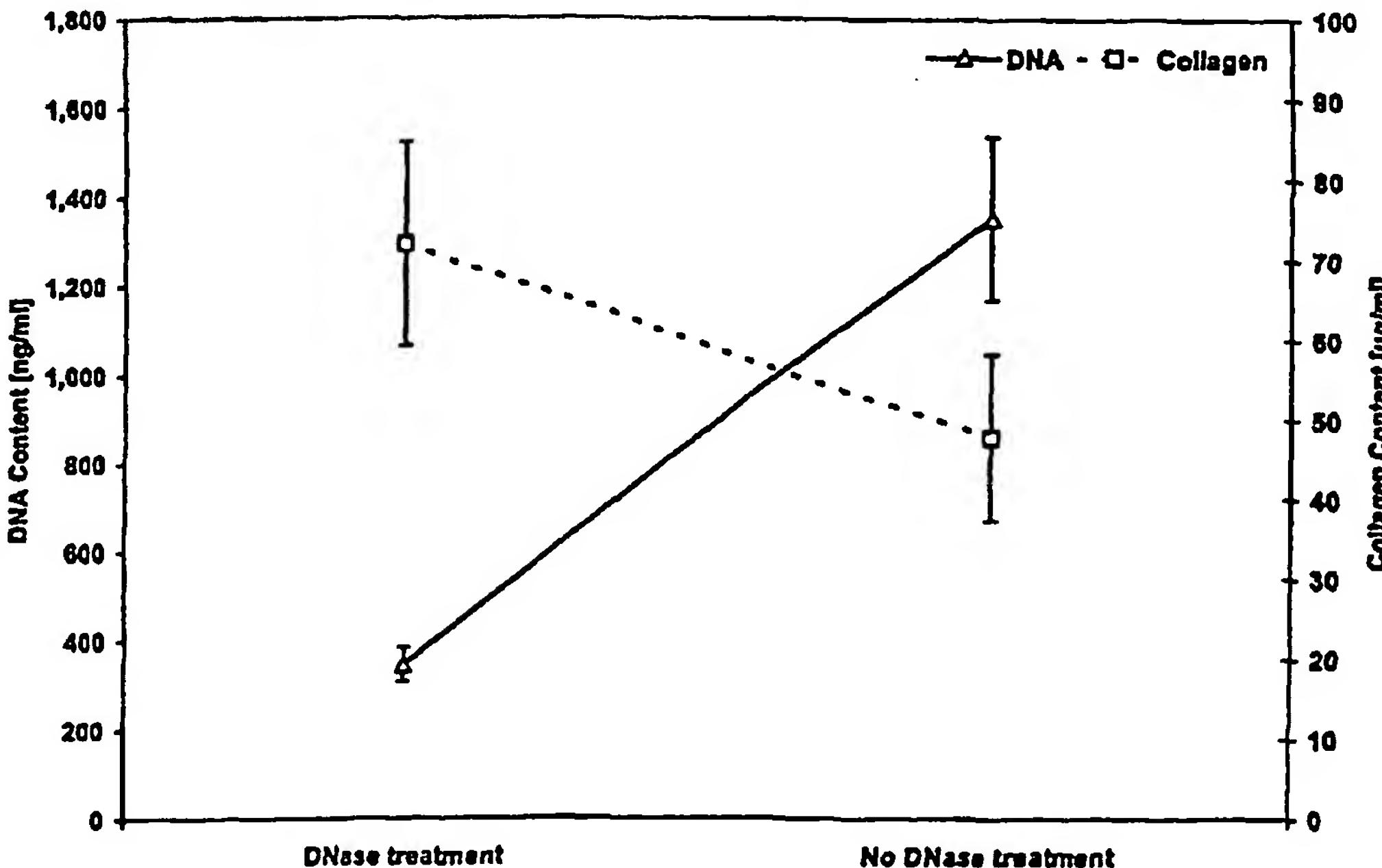
(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

*[Continued on next page]*

(54) Title: DECELLULARIZED BONE MARROW EXTRACELLULAR MATRIX



**WO 2005/009498 A3**

(57) Abstract: The invention is directed to compositions comprising decellularized bone marrow extracellular matrix and uses thereof. Methods for repairing or regenerating defective, diseased, damaged or ischemic tissues or organs in a subject, preferably a human, using the decellularized bone marrow extracellular matrix of the invention are also provided. The invention is further directed to a medical device, preferably a stent or an artificial heart, and biocompatible materials, preferably a tissue regeneration scaffold, comprising decellularized bone marrow extracellular matrix for implantation into a subject.



- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:  
24 March 2005

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/023188

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 A61L27/36 A61L31/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, EMBASE, PAJ, WPI Data, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.                            |
|------------|--|--|
| X          | <p>LEE M ET AL: "Comparison of bone marrow extracellular matrices"<br/> <b>BIOCHIMICA ET BIOPHYSICA ACTA - GENERAL SUBJECTS</b>, ELSEVIER SCIENCE PUBLISHERS, NL,<br/>   vol. 1428, no. 2-3,<br/>   5 August 1999 (1999-08-05), pages 300-304,<br/>   XP004276451<br/>   ISSN: 0304-4165<br/>   "Preparation of bovine bone marrow extracts" on page 301</p> <p>-----</p> <p style="text-align: center;">-/-</p> | 1-3, 5-7,<br>12-19,<br>21-25,<br>50-57,<br>59-65 |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## ° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

19 January 2005

Date of mailing of the international search report

28/01/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Pilling, S

## INTERNATIONAL SEARCH REPORT

National Application No

PCT/US2004/023188

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.                           |
|----------|--|---|
| X        | VITURI C L ET AL: "Alterations in proteins of bone marrow extracellular matrix in undernourished mice"<br>BRAZILIAN JOURNAL OF MEDICAL AND BIOLOGICAL RESEARCH,<br>vol. 33, no. 8, August 2000 (2000-08),<br>pages 889-895, XP009042495<br>ISSN: 0100-879X<br>"Extracellular matrix protein extraction"<br>on page 890<br>-----      | 1-3,5-7,<br>12-19,<br>21-25,<br>50-57,<br>59-65 |
| X        | PETERS CHARLES ET AL: "Ovine bone marrow extracellular matrix and soluble protein extraction: Fetuin amino terminus microheterogeneity"<br>AMERICAN JOURNAL OF THE MEDICAL SCIENCES,<br>vol. 309, no. 5, 1995, pages 285-294,<br>XP009042490<br>ISSN: 0002-9629<br>"Extracellular matrix protein extraction"<br>on page 286<br>----- | 1-3,5-7,<br>12-19,<br>21-25,<br>50-57,<br>59-65 |
| X        | WO 01/03750 A (ADVANCED TISSUE SCIENCES INC) 18 January 2001 (2001-01-18)<br>page 6, line 12 - line 25<br>page 7, line 18 - line 32<br>page 20, line 19 - line 28<br>-----   | 1-65  |
| X        | WO 97/18842 A (ABATANGELO GIOVANNI ; CALLEGARO LANFRANCO (IT); FIDIA ADVANCED BIOPOLY) 29 May 1997 (1997-05-29)<br>cited in the application abstract<br>page 3, line 26 - page 4, line 6<br>-----  | 1-65  |

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/023188

| Patent document cited in search report |   | Publication date |  | Patent family member(s)  |  | Publication date   |
|--|---|------------------|--|--|--|--|
| WO 0103750                             | A | 18-01-2001       | AU<br>EP<br>WO   | 6072200 A<br>1196206 A1<br>0103750 A1  |  | 30-01-2001<br>17-04-2002<br>18-01-2001   |
| WO 9718842                             | A | 29-05-1997       | IT<br>AT<br>AU<br>AU<br>CA<br>DE<br>DE<br>DK<br>WO<br>EP<br>ES<br>IL<br>JP<br>PT<br>US<br>US | PD950225 A1<br>231730 T<br>709236 B2<br>7693496 A<br>2238011 A1<br>69626035 D1<br>69626035 T2<br>863776 T3<br>9718842 A1<br>0863776 A1<br>2189890 T3<br>124450 A<br>2000500372 T<br>863776 T<br>6596274 B1<br>6482231 B1 |  | 20-05-1997<br>15-02-2003<br>26-08-1999<br>11-06-1997<br>29-05-1997<br>06-03-2003<br>22-01-2004<br>26-05-2003<br>29-05-1997<br>16-09-1998<br>16-07-2003<br>19-02-2004<br>18-01-2000<br>30-06-2003<br>22-07-2003<br>19-11-2002 |